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COMPLETE SPECIFICATION

PATENTS ACT, 1949

SPECIFICATION NO. 769,456

The inventors of this invention in the sense of being the actual devisers thereof within the meaning of Section 13 of the Patents Act, 1949 are William de Back, a Citizen of the United States of America, of 10, rue Quellin, Anvers, Belgium and Charles Tack, a Belgian subject, of rue Conscience 32, Saint-nicolas-Waes, Belgium.

THE PATENT OFFICE,

15th February, 1957

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submitted in a reservoir to the action of a fixed temperature by means of a liquid in which they are kept immersed during the treatment.

This treatment has, up to the present been effected in apparatus having perforated rotatable drums by the action of a liquid raised to a certain temperature but difficulties always arose owing to the fact that the products were damaged by the rotation of the drums and that the effect of the scalding was not uniform.

The object of the present invention is to avoid any deterioration of the vegetables or the fruit whilst they are in the machine and to act so that the scalding may occur with the uniformity and intensity exactly desired and by avoiding, on the one hand, any direct contact between the product and the steam and, on the other hand, any rubbing or rolling on metal parts.

Another object is to reduce greatly the activity of thermophilic bacteria, the effect of which is to cause the fermentation of the product at certain temperatures.

A further object of the present invention is to produce an apparatus of simple construction which may be easily cleaned and fulfils the requirements of the method.

According to the present invention the products are kept in a state of suspension in the liquid, that is to say, do not come substantially into contact with the walls of the vessel or with the atmosphere, for which

or channels bounded in each case by the wall of the cylinder and two successive blades of the screw, this base containing a mixture of liquid at a controlled temperature and material to be scalded.

The circulation of the water is effected in such a manner that the screw does not act as a conveyor member and that it does not therefore harm the green peas or other products.

The injection of steam into the outer tube is used simultaneously for maintaining the circulation and for heating the water or other liquid.

The invention will be described further, by way of example, with reference to the accompanying drawings in which:—

Fig. 1 is an elevation of the reservoir with the exterior removed;

Fig. 2 is a corresponding plan view, likewise with the exterior removed;

Figs. 3 and 4 are sectional diagrams respectively on the lines III-III and IV-IV; and

Fig. 5 is a detail.

The apparatus comprises a reservoir of a lower cylindrical part 1 and of a removable truncated upper part 2 resting in grooves 3 which are provided on the edges of the lower cylindrical part. This reservoir or bowl rests on supports 1'.

In the bowl a screw 4 is a type of Archimedean screw which is formed round an axis 5 and which conforms accurately

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COMPLETE SPECIFICATION

Improved method and apparatus for blanching peas and pea-like vegetables

We, INTERNATIONAL MACHINERY CORPORATION S.A., a Belgian Company, of 3, Breedstraat, St.-Nicolas-Waes, Belgium, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention concerns a method and apparatus for blanching peas and pea-like vegetables, wherein the products are submitted in a reservoir to the action of a fixed temperature by means of a liquid in which they are kept immersed during the treatment.

This treatment has, up to the present been effected in apparatus having perforated rotatable drums by the action of a liquid raised to a certain temperature but difficulties always arose owing to the fact that the products were damaged by the rotation of the drums and that the effect of the scalding was not uniform.

The object of the present invention is to avoid any deterioration of the vegetables or the fruit whilst they are in the machine and to act so that the scalding may occur with the uniformity and intensity exactly desired and by avoiding, on the one hand, any direct contact between the product and the steam and, on the other hand, any rubbing or rolling on metal parts.

Another object is to reduce greatly the activity of thermophilic bacteria, the effect of which is to cause the fermentation of the product at certain temperatures.

A further object of the present invention is to produce an apparatus of simple construction which may be easily cleaned and fulfils the requirements of the method.

According to the present invention the products are kept in a state of suspension in the liquid, that is to say, do not come substantially into contact with the walls of the vessel or with the atmosphere, for which

purpose the liquid is kept in continuous movement by the intervention of a jet of steam or another propelling agent provided in a conduit situated outside the vessel between the inlet and outlet, forming a closed circuit for the liquid.

In the embodiment of the invention the apparatus used comprises a horizontally disposed bowl in which is mounted a screw which is accurately adapted to the lower part of this bowl and which produces in the lower portion a space formed by a series of chambers bounded in each case by the wall of the cylinder and two successive blades of the screw, this base containing a mixture of liquid at a controlled temperature and material to be scalded.

The circulation of the water is effected in such a manner that the screw does not act as a conveyor member and that it does not therefore harm the green peas or other products.

The injection of steam into the outer tube is used simultaneously for maintaining the circulation and for heating the water or other liquid.

The invention will be described further, by way of example, with reference to the accompanying drawings in which:—

Fig. 1 is an elevation of the reservoir with the exterior removed;

Fig. 2 is a corresponding plan view, likewise with the exterior removed;

Figs. 3 and 4 are sectional diagrams respectively on the lines III-III and IV-IV; and

Fig. 5 is a detail.

The apparatus comprises a reservoir of a lower cylindrical part 1 and of a removable truncated upper part 2 resting in grooves 3 which are provided on the edges of the lower cylindrical part. This reservoir or bowl rests on supports 1'.

In the bowl a screw 4 is a type of Archimedean screw which is formed round an axis 5 and which conforms accurately

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to the lower part of the bowl and is rotated therein.

The material is introduced into the bowl by a funnel 6 and issues by an inclined plane 7 discharging inside a bucket wheel 8 at the end of the Archimedeian screw inside the bowl.

An important feature of the machine is that along one of the longitudinal sides of the bowl and on the exterior thereof there is provided a pipe 9 which ensures communication between the rear portion and front portion of the bowl and which is connected by small tubes 10 and 11 respectively with a discharge opening 12 for the liquid and with an admission opening 13 in the bowl.

In the pipe 9 there is provided near the discharge tube 10 a Venturi device comprising a converging element 14 and a diverging element 15 and in the axis of the pipe 9 is disposed a tube 16 for conveying the steam which discharges into the converging element.

The injection of steam is used for producing the circulation of the water and heating the liquid to the desired temperature.

The pipe 9 is closed at its end located beyond the pipe 11 by a plug 17.

It should be noted that it is not a function of the screw 4 to displace the material or to set it in movement, but to define in the lower part of the bowl closed spaces formed by a series of chambers bounded in each case by the wall of the cylinder, and by the two successive blades of the screw (a space which thus corresponds to one thread channel of the screw).

These spaces contain a mixture of water at a well regulated temperature and material to be scalded which is maintained at this temperature during a period likewise determined by and corresponding to the time required for the scalding operation.

In this manner the product to be treated is withheld from unfavourable influences which could be caused by variations of temperature, hot or cold currents of water and jets of steam and a medium is produced in which scalding may be effected constantly, exactly, and uniformly.

The jet of steam introduced at 16 has the object of:

1. determining the circulation of the product in the bowl:

2. returning to the desired temperature the water which has been discharged.

This jet of steam, combined with the Venturi effect, exerts on the liquid in the bowl a suction action in the direction of the discharge pipe 10 and subjects it to slight pressure in the pipe 9 as to allow an outflow in the direction of the arrow F towards the admission pipe 11 and the opening 13.

In its general effect this discharge should be simply sufficient to cause the liquid to circulate and to keep the product in the pan in a condition wherein it is immersed without touching the wall of the bowl and in principle without being brought to the surface in contact with the air.

After the product has passed through the apparatus there is produced in the wheel 8 a separation in such directions that the green peas or other products are caught by the buckets 18 and are diverted into the trough 7 whilst the water flows away towards the opening 12 passing through the holes 19 in the drum 20.

As will be easily understood, the jet of steam introduced through the pipe 16 transmits its heat to the water conveyed from the bowl and raises it to the desired temperature.

The circulation of the water may be very easily regulated by the jet of steam.

Automatic apparatus may be used for regulating the temperature and the scalding time.

Independently of the circulation automatic control of the temperature may also be provided in each compartment bounded by the two successive blades of the Archimedeian screw, and for this purpose there may be provided, as shown in Fig. 5, lateral hot water supplies in the cylinder 1 which are obtained by tubes 21 branching from the pipe 9 and in which tubes 22 discharge which are connected with a main conduit 23 and which exert a suction effect on the water in the pipe 9.

The truncated form of the cover which replaces the old coverings of circular shape permits easy evacuation of the condensates towards the grooves 3 whilst preventing the said condensates from falling into the liquid or into the product to be treated.

Another important difference is that a rotatable perforated drum is entirely eliminated.

What we claim is:—

1. A process for blanching peas and pea-like vegetables, wherein the products are submitted in a reservoir to the action of a fixed temperature by means of a liquid in which they are kept immersed during the treatment, characterised in that the products are kept in a state of suspension in the liquid, that is to say, do not come substantially into contact with the walls of the vessel or with the atmosphere, and in that, for this purpose the liquid is kept in continuous movement by the intervention of a jet of steam or another propelling agent provided in a conduit situated outside the vessel between the inlet and outlet, forming a closed circuit for the liquid.

2. An apparatus, for carrying out the process according to claim 1, in which the

blanching vessel is provided with a screw which fits accurately into the lower part of this vessel and which determines spaces delimited by two successive paddles of the screw, these spaces containing a mixture of water and of material to be blanched for a well defined time at a well defined temperature.

3. An apparatus as claimed in claim 2, characterised by a nozzle extending along one of the longitudinal sides of the vessel and ensuring a communication between the inlet and outlet, this nozzle being provided with a Venturi into which opens a pipe throwing a jet of steam, so as to create a suction on the outlet side for the products and an effect of driving back the liquid towards the inlet to the reservoir.

4. An apparatus as claimed in claim 2 characterised in that on the outlet side there is provided a paddle wheel which is surrounded by a perforated drum and which receives the products according to their rate of advance in the vessel, and that in this wheel the green peas or other products are carried off by the paddles and are thrown into a gutter ending at the centre of this wheel, whilst the water flows away passing

through the holes provided in the drum.

5. An apparatus as claimed in claim 2 characterised in that there is provided, in the reservoir, lateral inlets for the liquid by which the peas are treated and in which they are immersed, those inlets opening into the compartments delimited by the successive blades of the screw and being branched on the conduit situated outside the reservoir, tubes, connected to a main conduit, being provided which discharge steam into the said inlets, adapted to exert a suction effect on the liquid in the said outside pipe.

6. An apparatus as claimed in claim 2, which at the upper part is formed of inclined walls descending towards longitudinal gutters.

7. A process for blanching peas and pea-like vegetables, substantially as described herein.

8. An apparatus for blanching peas and pea-like vegetables substantially as herein described with reference to and as illustrated in the accompanying drawings.

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